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EXAMINER	
LOO, JUVENA W	
ART UNIT	**PAPER NUMBER**
2609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,022	WHITTAKER STEWART, MARK ANDREW	
	Examiner	Art Unit	
	Juvena W. Loo	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 November 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 November 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This is in response to application filed on November 25, 2003 in which claims 1 to 18 are presented for examination.

Status of Claims

Claims 1-18 are pending, of which claims 1, 9, and 14 are in independent form.

Specification

1. The specification is objected to because the application numbers for the related cases are not listed.

Claim Objections

2. Claims 3, 4, 5, 6, 7, 9, 14, 17, and 18 are objected to because of the following informalities: In particular, claims 3, 4, 5, 6, 7, 9, 14, 17, and 18 are objected to because they include reference characters, DLID, which are not enclosed within parentheses. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 3, 5, 6, 7, 9, 13, 14, 17, and 18 contain the trademark/trade name InfiniBand. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218

USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe InfiniBand Switch and, accordingly, the identification/description is indefinite.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 9, 10, 11, 12, and 13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 6, 7, 8, and 9 of copending Application No. 10/721,213. The conflicting claims are not identical since the current application (No. 10/722,022) is directed to a network while the other one is directed to an InfiniBand switch (Application No. 10/721,213). The network and the InfiniBand switch have different functional entities and are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art at the time of the invention to use the InfiniBand switch in the network. The motivation is that the switching will allow the network to direct data to different destinations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17 of copending Application No. 10/722021. The conflicting claims are not identical since the current application (No. 10/722,022) is directed to a network while the other one is directed to a connection controller (Application No. 10/722,021). The network and the connection controller have different functional entities and are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art at the time of the invention to use the controller for the purpose of calculating an actual traffic pattern through the network.

The motivation is to enhance the controller's ability to compute the best path for data transfer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, and 4 are rejected under 35 USC 102(b) as being anticipated by Bertin et al. US 6,400,681 B1 (hereinafter Bertin).

Regarding claim 1, Bertin discloses a topology database (Figure 5); a requested traffic pattern for a packet (lines 47-49 column 11 – connection request, including parameters such as origin and destination address, data flow characteristics, is specified by the user); a module coupled to receive a requested traffic pattern and compute an actual traffic pattern based on the request and the network topology data such that the network operates as a strictly non-interfering network (lines 50-52 column 11 – a path and a set of requests for each link of the path are determined using parameters provided by the Topology Database; Figure 7 - all the predetermined paths,

corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database) and communicates the actual traffic pattern to the source corresponding to the packet (lines 53-65 column 11 - connection request is used to reserve bandwidth on every nodes (origin, transit, and destination) in the path. The transit and destination nodes answer the source/request by sending back either a call acceptance or a call reject).

Regarding claim 2, Bertin discloses a method to compute the actual traffic pattern utilizing the requested traffic pattern and the network topology data (Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links contain enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

Regarding claim 4, Bertin discloses a method in computing an actual traffic pattern comprises of executing a rearrangement algorithm (Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfies the request, the path is

selected if all its links provide enough bandwidth; furthermore, the shortest route, with dedicated bandwidth, is chosen from the selected paths); and assigning one of a plurality of DLID such that the network operates as a strictly non-interfering network (Figure 4, Path Table (410) – the selected path, with dedicated bandwidth, contains at least the destination node and the selected path).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3, 5, 6, 7, 9, 11-15, 17 and 18 are rejected under 35 USC 103(a) as being unpatentable over Bertin et al. (US 6,400,681 B1) in view of Brahmaroutu (US 2003/0033427 A1).

Regarding claim 3, Bertin discloses all the limitations of claim 1 above. Additionally, Bertin discloses methods that calculate a plurality of routing trees for a plurality of switches in the network (Figure 9, line 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones); calculates a plurality of DLIDs and

a set of forwarding instructions for each switch (line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met); each of the plurality of DLID corresponds to one of the plurality of routing trees and one of a plurality of destinations (lines 37-39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); and populates a forwarding table (line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in the Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database). However, Bertin fails to teach that the switch is an InfiniBand switch.

In the same field of endeavor, Brahmaroutu discloses an InfiniBand switch (Brahmaroutu; Figure 1 - an InfiniBand switch fabric) that routes packets based on the information in a forwarding table (Brahmaroutu; Page 3, Section 28 – the packet's header may contain fields such as a destination local identifier used to identify the destination port and data path in the data network, and a source local identifier used to identify the source port used for routing by switches within the network). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply an InfiniBand switch as disclosed by Brahmaroutu into the network of Bertin. The

motivation would have been in reducing latency because InfiniBand switch provides multiple paths between port pairs.

Regarding claim 5, Bertin discloses all the limitations of claim 4 above. Additionally, Bertin discloses a packet follows a path through at least a portion of a plurality of switches (lines 26-27, column 7 – incoming data packets are selectively routed onto the outgoing Trunks towards neighboring nodes); and each of the portion of the switches forwards the packet according to one of the plurality of DLIDs assigned to the packet such that the network operates as a strictly non-interfering network (lines 28-29, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database). However, Bertin fails to teach that the switch is an InfiniBand switch.

In the same field of endeavor, Brahmaroutu discloses an InfiniBand switch (Brahmaroutu; Figure 1 – an InfiniBand switch fabric) that routes packets based on the information in a forwarding table (Brahmaroutu; Page 3, Section 28 – the packet's header may contain fields such as a destination local identifier used to identify the destination port and data path in the data network, and a source local identifier used to

identify the source port used for routing by switches within the network). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply an InfiniBand switch as disclosed by Brahmaroutu into the network of Bertin. The motivation would have been in reducing latency because InfiniBand switch provides multiple paths between port pairs.

Regarding claim 6, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 5 above. Additionally, Bertin discloses each portion of the plurality of switches looks up the one of the plurality of DLIDs assigned to the packet in a forwarding table at the switch (lines 28-29 column 7 – routing decisions are made according to the information contained in the header of the data packets).

Regarding claim 7, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 5 above. Additionally, Bertin discloses each of the portion of the plurality of switch forwards the packet according to the DLID assigned (lines 26-27, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet).

Regarding claim 9, Bertin discloses methods that calculate a plurality of routing trees for a plurality of switches in the network (Figure 9, lines 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned

periodically for identifying new paths or for updating existing ones); calculates a plurality of DLIDs and a set of forwarding instructions for each switch (line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met); each of the plurality of DLID corresponds to one of the plurality of routing trees and one of a plurality of destinations (lines 37-39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); and populates a forwarding table (line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in the Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database). However, Bertin fails to teach that the switch is an InfiniBand switch.

In the same field of endeavor, Brahmaroutu discloses an InfiniBand switch (Brahmaroutu; Figure 1 – an InfiniBand switch fabric) that routes packets based on the information in a forwarding table (Brahmaroutu; Page 3, Section 28 – the packet's header may contain fields such as a destination local identifier used to identify the destination port and data path in the data network, and a source local identifier used to identify the source port used for routing by switches within the network). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply an InfiniBand switch as disclosed by Brahmaroutu into the network of Bertin. The

motivation would have been in reducing latency because InfiniBand switch provides multiple paths between port pairs.

Regarding claim 11, Bertin discloses each of the plurality of end nodes comprises a destination (lines 52-53 column 5 – each node comprises one or more communication devices for receiving or transmitting data packets). However, Bertin fails to teach that the destination is identified by a BaseLID.

In the same field of endeavor, Brahmaroutu discloses every switch and each port may have one or more Local Identifiers (LIDs) (Brahmaroutu; Page 4, Section 31). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a local identifier as disclosed by Brahmaroutu into the teaching of Bertin. The motivation would have been in allowing multiple identifiers.

Regarding claim 12, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 9 above. Additionally, Bertin discloses calculating a plurality of routing trees for each spine node in the network (Figure 9, lines 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones). Bertin also discloses calculating a shortest path from the spine node to each of the plurality of end nodes (lines 41-44 column 14 – a path is calculated with as few links as possible that supports the quality-of-service requirements of the request).

Regarding claim 13, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 9 above. Additionally, Bertin discloses each of the plurality of routing trees comprises at least a portion of switches and the corresponding links that form a shortest path from the end nodes to a spine node (lines 41-44, column 14).

Regarding claim 14, Bertin discloses a system that forward a packet, created at a source and is addressed to a destination within a network (lines 17-26, column 8 – once the optimum paths through the network are calculated, based on a set of quality of service specifications, so that minimum network resources are used, the header of the packets is generated in the node); comprising executing a rearrangement algorithm for the network (Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected if its entire links provide enough bandwidth. Moreover, the shortest route, with dedicated bandwidth, is chosen from the selected paths); assigning one of a plurality of DLIDs to the packet (lines 17-22 column 8 – the optimum path is put in the header of the packet); the packet follows a path through at least a portion of a plurality of switches from the source to the destination (lines 10-16 column 8 – the packet is routed according to the information in the header). However, Bertin fails to teach that the switch is an InfiniBand switch.

In the same field of endeavor, Brahmaroutu discloses an InfiniBand switch (Brahmaroutu; Figure 1 – an InfiniBand switch fabric) that routes packets based on the

information in a forwarding table (Brahmaroutu; Page 3, Section 28 – the packet's header may contain fields such as a destination local identifier used to identify the destination port and data path in the data network, and a source local identifier used to identify the source port used for routing by switches within the network). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply an InfiniBand switch as disclosed by Brahmaroutu into the network of Bertin. The motivation would have been in reducing latency because InfiniBand switch provides multiple paths between port pairs.

Regarding claim 15, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 14 above. Additionally, Bertin discloses the network operates as a strictly non-interfering network (Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from all the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

Regarding claim 17, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 14 above. Additionally, Bertin discloses each portion of the plurality of switches looks up the one of the plurality of DLIDs assigned to the packet in a

forwarding table at the switch (lines 28-29 column 7 – routing decisions are made according to the information contained in the header of the data packets).

Regarding claim 18, the combination of Bertin and Brahmaroutu discloses all the limitations of claim 14 above. Additionally, Bertin discloses each portion of the plurality of switches forwards the packet according to the one of the plurality of DLIDs assigned to the packet as in the forwarding table (lines 28-29, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet).

11. Claim 8 is rejected under 35 USC 103(a) as being unpatentable over Bertin et al. (US 6,400,681 B1) in view of Yang et al. (US Patent 5,940,389).

Regarding claim 8, Bertin discloses all of claim 1 above. However, Bertin fails to teach that the switch fabric is a CLOS network. In the same field of endeavor, Yang et al. discloses a Benes Network, which is a special case of a CLOS network, can be used as a switch fabric (Yang; lines 32-36 column 6) and that each node in the network has an entry, which is indexed by an identifier and contains information regarding how to transmit received cells to the next node, in the routing table (Yang; lines 30-37 column 2). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a CLOS network as disclosed by Yang into the network of Bertin. The motivation would have been in reducing latency because CLOS network is well known and expected in the art.

12. Claims 10 and 16 are rejected under 35 USC 103(a) as being unpatentable over Bertin et al., (US 6,400,681 B1) in view of Brahmaroutu (US 2003/0033427 A1) in view of Yang et al. (US Patent 5,940,389).

Regarding claim 10, the combination of Bertin and Brahmaroutu disclose all of claim 9 above. However, Bertin fails to teach that the switch fabric is a CLOS network. In the same field of endeavor, Yang et al. discloses a Benes Network, which is a special case of a CLOS network, can be used as a switch fabric (Yang; lines 32-36 column 6) and that each node in the network has an entry, which is indexed by an identifier and contains information regarding how to transmit received cells to the next node, in the routing table (Yang; lines 30-37 column 2). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a CLOS network as disclosed by Yang into the network of Bertin. The motivation would have been in reducing latency because CLOS network is well known and expected in the art.

Regarding claim 16, the combination of Bertin and Brahmaroutu disclose all of claim 14 above. However, Bertin fails to teach that the switch fabric is a CLOS network. In the same field of endeavor, Yang et al. discloses a Benes Network, which is a special case of a CLOS network, can be used as a switch fabric (Yang; lines 32-36 column 6) and that each node in the network has an entry, which is indexed by an identifier and contains information regarding how to transmit received cells to the next node, in the routing table (Yang; lines 30-37 column 2). Thus, it would have been obvious to one of

ordinary skill in the art at the time of the invention to apply a CLOS network as disclosed by Yang into the network of Bertin. The motivation would have been in reducing latency because CLOS network is well known and expected in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juvena W. Loo whose telephone number is (571) 270-1974. The examiner can normally be reached on Mon.-Thurs : 7:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Coby can be reached on (571) 272-4017. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juvena W Loo
Examiner
Art Unit 2609

Frantz Coby
FRANTZ COBY
PRIMARY EXAMINER